

Kunio IWATSUKI*: On the reticulate venation of *Tectaria***

岩槻邦男*: ナナバケシダ属の葉脈**

Since the time of Presl and Fée, the pattern of venation has highly been evaluated in the generic classification among the higher leptosporangiate ferns. This makes no exception in the case of the Tectarioid series of ferns. *Ctenitis*, *Lastreopsis*, *Cyclopeltis* and *Pteridrys* are defined by having the free venation, while *Quercifilix* and *Arcypteris* have the sagenioid and *Pleocnemia* the pleocnemioid venations. In *Heterogonium*, on the contrary, both the free and the reticulate veined species are belonged.

The genus *Tectaria* is a vast one containing species considerably heterogeneous in various characteristics, and sometimes subdivided into a number of genera. Concerning to the venation, in *Tectaria* are included the free veined species as well as those with drynarioid or sagenioid venation. Ching¹⁾ separated *Ctenitopsis* from *Tectaria* for such free veined or simply anastomosing members as *T. ingens*, *T. fuscipes*, *T. devexa* and others. This genus is defined solely by venation so that the species with less affinity are lumped together. Moreover, there is an opinion that some phyletic lines may be traced from the members of *Ctenitis* to those of *Tectaria* in parallel, representing the species with venation in *Ctenitis* stage or in *Tectaria* stage. As shown in the cases between *Thelypteris* and *Cyclosorus*²⁾, and between *Bolbitis* and *Egenolfia*³⁾, the difference in the pattern of venation is not a universal feature to indicate the phyletic groups at the generic rank. Thus, the generic separation is not distinct between *Ctenitopsis* and the reticulate species of *Tectaria*. On so-called sagenioid and drynarioid venations, however, any special investigation has not been made from the standpoint of phylogeny. In this paper, these two types of venation are compared by their developing stages, and the taxonomic evaluation of them is examined in view of the comparative morphology.

* Department of Botany, Faculty of Science, Kyoto University, Kyoto. 京都大学理学部植物学教室.

** This study is partly supported by the Grant in aid of scientific research of the Ministry of Education.

Materials and Observations For the sagenioid venation, *Tectaria gemmifera* is observed and figured in Fig. 1, which is drawn from the plants cultivated in the green-house of Kyoto University. The early developmental stages in venation are like those of *Dictyocline griffithii*⁴⁾, which had been

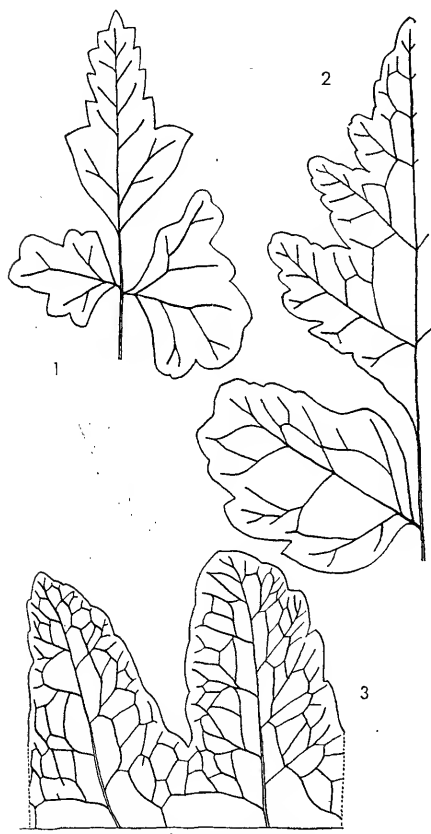


Fig. 1. Various developmental stages of venation in *Tectaria gemmifera*.

referred to Tectarioid series by its venation. At first, the veins are free and pinnate, the veinlets branching repeatedly in several times. The veins of *T. gemmifera* is not regularly pinnates as that of *Thelypteris*, whose veins are strictly pinnate forming goniopteroid or meniscioid venation in reticulate condition. The first areoles are costal ones formed by the conjunction between the opposite basal veinlets. The other veinlets are occasionally united to form the areoles outside costal ones arranging irregularly.

The drynarioid venation is observed and figured in Fig. 2 based on the juvenile plants of *Tectaria polymorpha* collected on Doi Tung in northern Thailand. In the early stages of development, the venation of this species is similar to that of the preceding one. In *T. polymorpha*, however, the areoles are formed successively outside the costal areoles. Moreover, the first branches of the lateral main veins (cross-veins) become thicker, forming the main areoles of venation. The veinlets of higher order are usually slender, though nearly all veinlets reticulate with the neighbouring ones to form the smaller areoles in irregular arrangement.

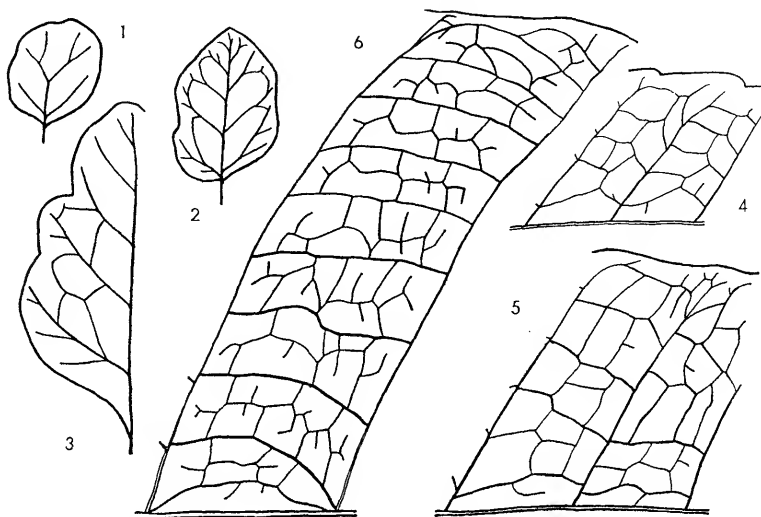


Fig. 2. Various developmental stages of venation in *Tectaria polymorpha*.

Discussion In *Tectaria* the drynarioid venation is seen in the species whose pinnae are not so deeply dissected. In such case, the areoles of venation become many in rows, and the first branches of lateral main veins form the areoles with ample spaces giving many smaller areoles. The sagenioid venation is formed, on the contrary, in the species having deeply lobed pinnae. The species bearing still finely dissected pinnae have the venation not anastomosing at all as seen in those belonged to *Ctenitopsis*. Thus, the patterns of venation in *Tectaria* are related in general to the degree of dissection in fronds, though there are some examples against that. As the areoles are different in size according to species, the main areoles and smaller ones are not so distinct in case of the smaller areoles being larger as in *T. decurrens*. *T. vasta* and *T. maingayi* are similar to *T. decurrens* in frond form and dissection, but the cross-veins are distinct in former species to form apparent main areoles including many smaller areoles. In spite of the presence of such example, it may be suggested that the complication in venation has derived in parallel in many species groups accompanied with the simplification of frond dissection. This may be supported by the fact that there are various intermediate forms of venation between the sagenioid and the

drynarioid venations in *Tectaria*, or even between the free and the anastomosing venations. From the facts observed above, it may be concluded that the infrageneric affinity in *Tectaria* should be traced by other characteristics than venation, though the pattern of venation is in itself useful to define the difference between species.

References

- 1) Ching, R. C.: Bull. Fan Mem. Inst. Biol. 8: 304 (1938), in Tard. & C. Chr., Not. Syst. 7: 86 (1938). 2) Iwatsuki, K.: Mem. Coll. Sci. Univ. Kyoto, B, 31: 21 (1964). 3) —: Acta Phytotax. Geobot. 18: 45 (1959). 4) —: *Ibid.*, 20: 219 (1962).

* * * *

ナナバケシダ属の種類群の類縁を論じる際、脈理の様式が重要な指標形質として取り上げられることがある。そこで、この属にみられる網状脈のうちで、網目が主脈と小脈との二重構造になっている drynarioid venation と、大きさに差はあってもすべての網目が平面的に配列されている sagenioid venation とを比較してみた。それぞれの葉脈が個体発生の初期段階でどんな変化をするか跡づけてみると、drynarioid venation の二重構造は脈の分岐が進むことから二次的に構成されるもので、葉面の分岐が浅くて網目の作られる面が広いものによくみかけられるものであることが分かった。この事実を他の形質群の比較から得た推論と照らし合わせてみると、ナナバケシダ属では、脈理の様式の差は系統的な差を示唆しているものではなくて、葉面の分岐の多様化に導かれて分化してきたものであることが推定でき、いろいろの種類群で平行的に表われたものだから、種差を定義する形質としては有効であるが、系統を指標する形質とはなり得ないものであると結論される。

○地衣類思い出話 (11) (富樫 誠) Makoto TOGASHI: Miscellaneous notes on lichens or lichenological survey (11)

Stereocaulon depreaultii Del. と云う地衣のタイプローカリティーは Newfoundland で、その syntype 標本が偶然朝比奈先生のハーバリウムにありその日附は 1828 年とある。昭和 29 年と 30 年に信州北佐久郡白樺湖畔で小生が採集したものがよく似て居るので、先生が之を Dr. Mackenzie Lamb に送って見て貰った処、正に *S. depreaultii* に違いなく世界第二の産地となった。あとで先生のハーバリウムをよく調べたら、自分が昭和 9 年に佐渡の金北山で同一種を採集し、又昭和 31 年には室井緯氏が陸中姫上山で採集して居るので、本種は北日本には稀ではないと思う。